



Case Study **Watermain Installation at the Sun Lake Forest Preserve**

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Applied Technologies, Inc.

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Project Overview

Purpose

- Connect the Village of Lake Villa's two separate water systems into a single system to receive CLCJAWA Lake Michigan water

Size

- 6,240 feet of 14-inch water main

Timeline

- Bid: September 2015
- Pre-con and construction start: February 2016
- Project complete: September 2016

Easement

Sun Lake Forest Preserve Utility Easement & Access

Lake County Forest Preserve District
Land Preservation and Special Projects
1899 W Winchester Rd
Libertyville, Illinois 60048
847-968-3351

Legend

- Sun Lake Trails
- 30 Foot Easement
- Forest Preserve Boundary

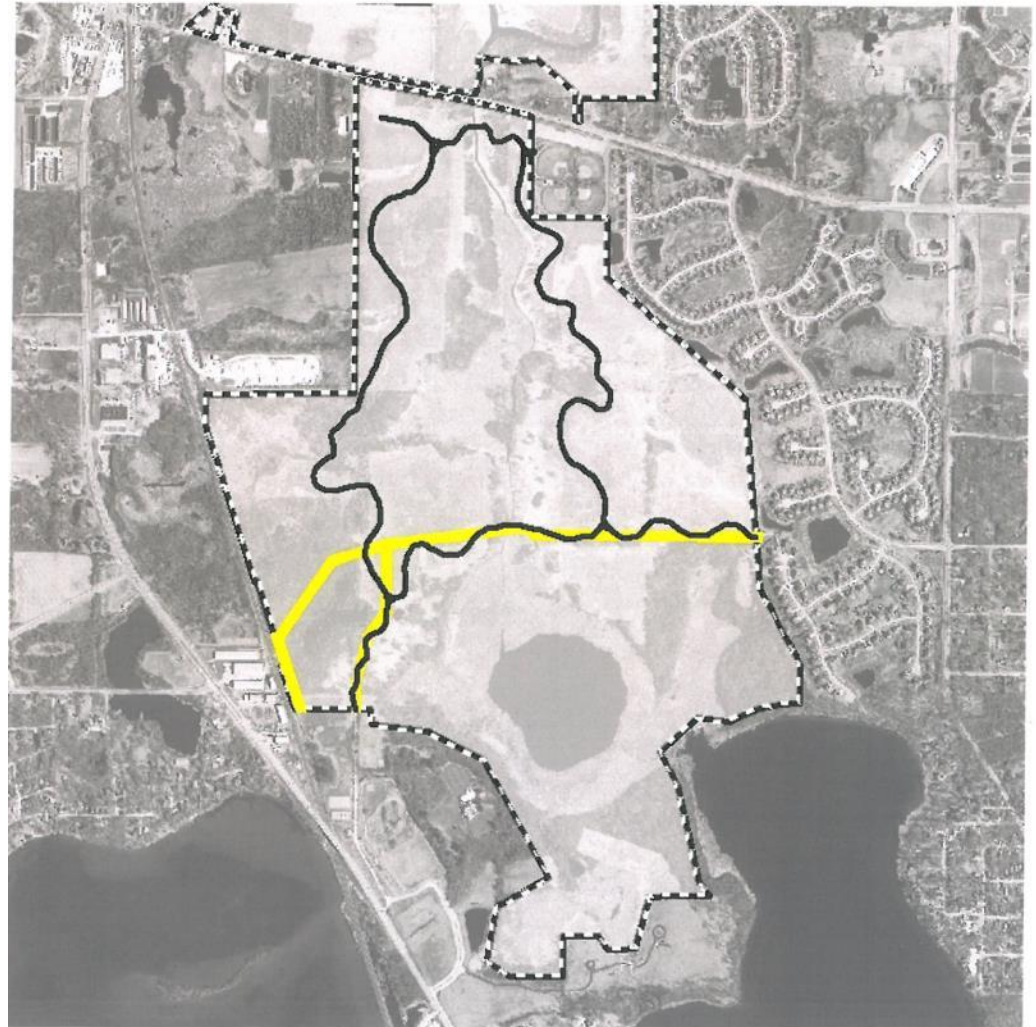
Courtesy Copy Only.
Property boundaries indicated are provided
for general location purposes. Wetland
and flood limits shown are approximate and
should not be used to determine setbacks for
structure or as a basis for purchasing property.

2014 Aerial Photo

Prepared using information from:
Lake County Department of Information
& Technology: GIS/Mapping Division
18 North County Street
Waukegan, Illinois 60085-4357
847-377-2373

Map Prepared 8 February 2016

0 500 1,000 2,000 Feet



Permitting

Typical Agencies

USACOE

**IEPA
Construction**


IEPA NPDES

LCSMC

IDNR

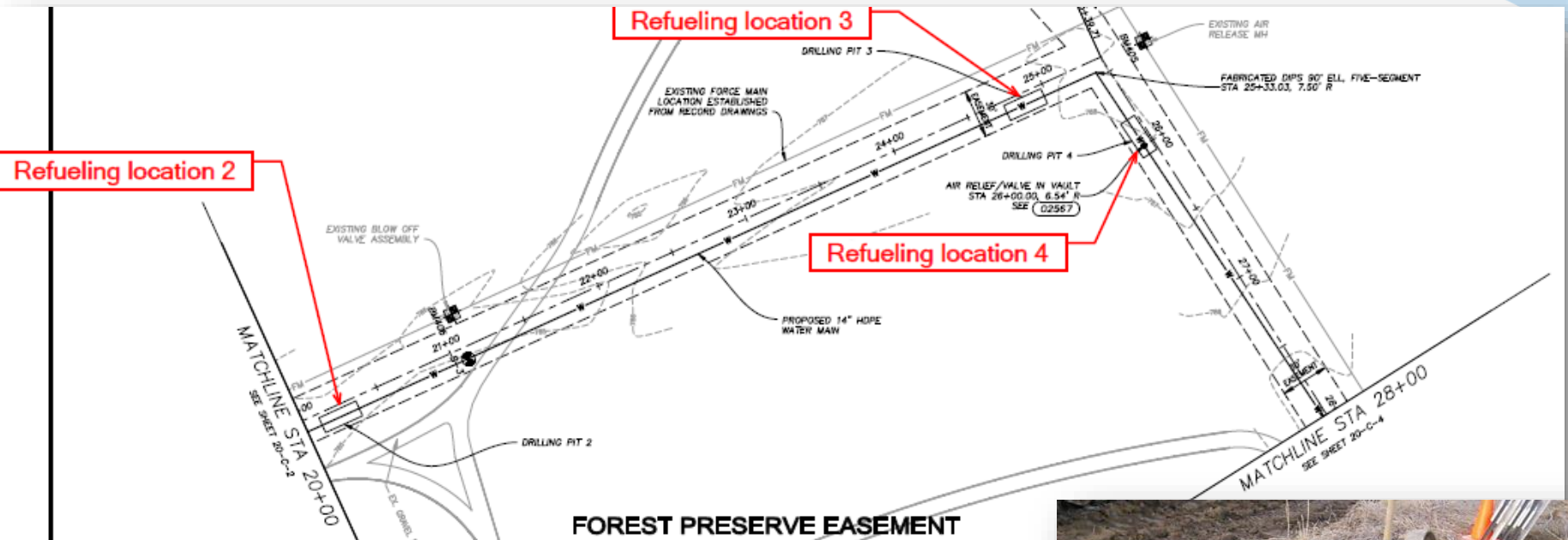
Permitting

Lake County Forest Preserve District & Illinois Nature Preserve Commission

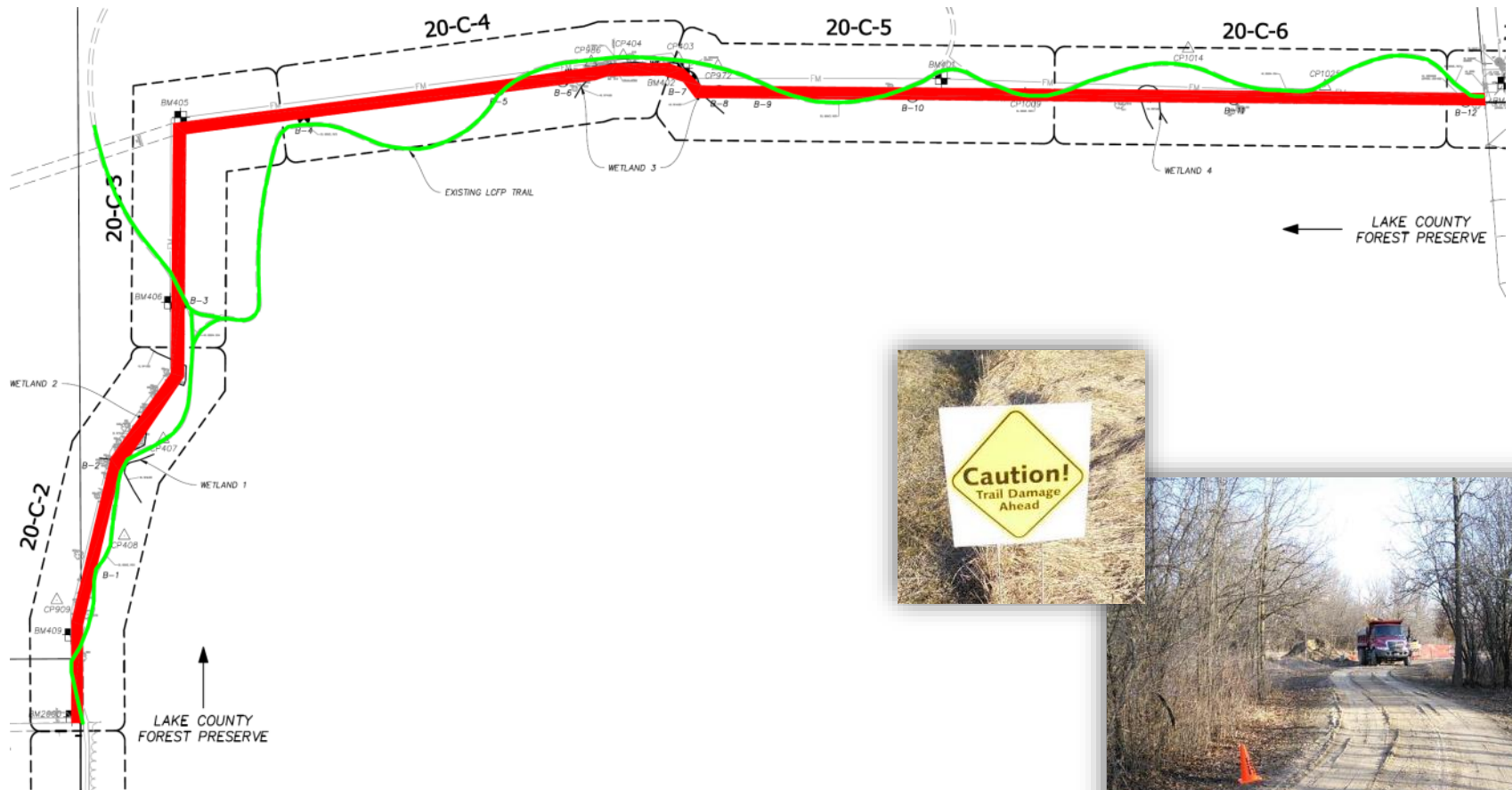


Construction work confined to the easement
Access to easement via the trail
Minimize off-trail disturbance
All equipment must be certified clean
Stage, store, and refuel off-site
Follow the approved SWPPP
Seed with approved native cover crop

On-Site Refueling



Water Main Through Sun Lake Forest Preserve



General Drilling Procedure

Excavate
the drill
and
receiving
pits

4-inch pilot
drill to
receiving
pit

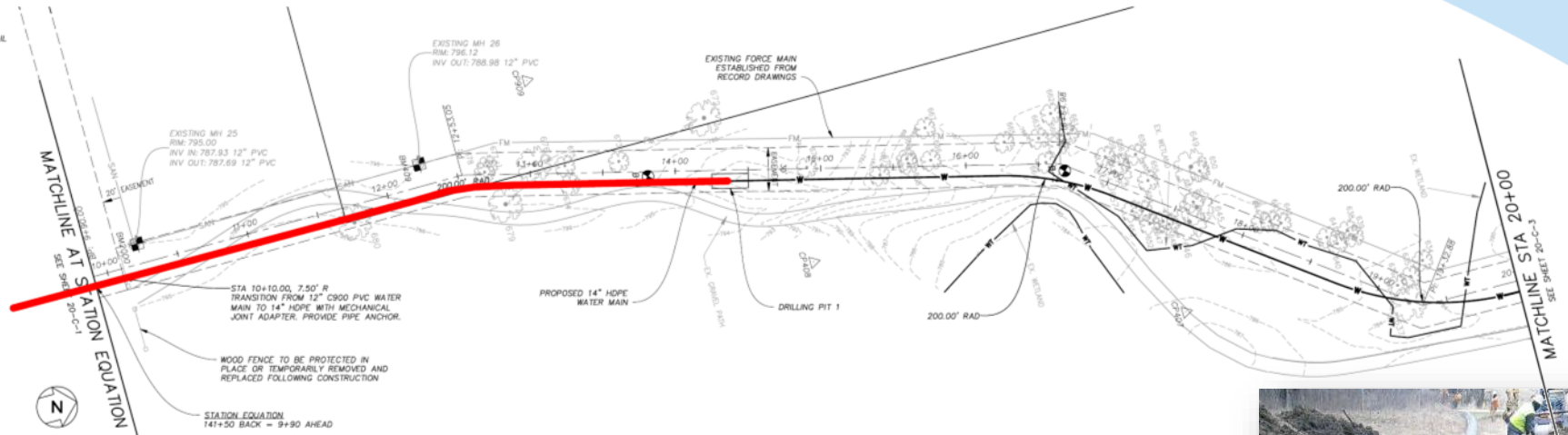
Pull back
with a
10-inch
auger

Ream to
14-inch

Ream to
20-inch



Drill #1



February
23-26, 2016

Temperature:
26° to 42°

No
precipitation

No frac outs

Pulled
425-foot of
pipe with
tracer wire in
45 minutes



Frac Outs

No matter how hard we try...

Frac outs can still happen.



Why?

Soils are not homogeneous

Sand seams, post holes, critter path,
etc. become pathways for frac outs



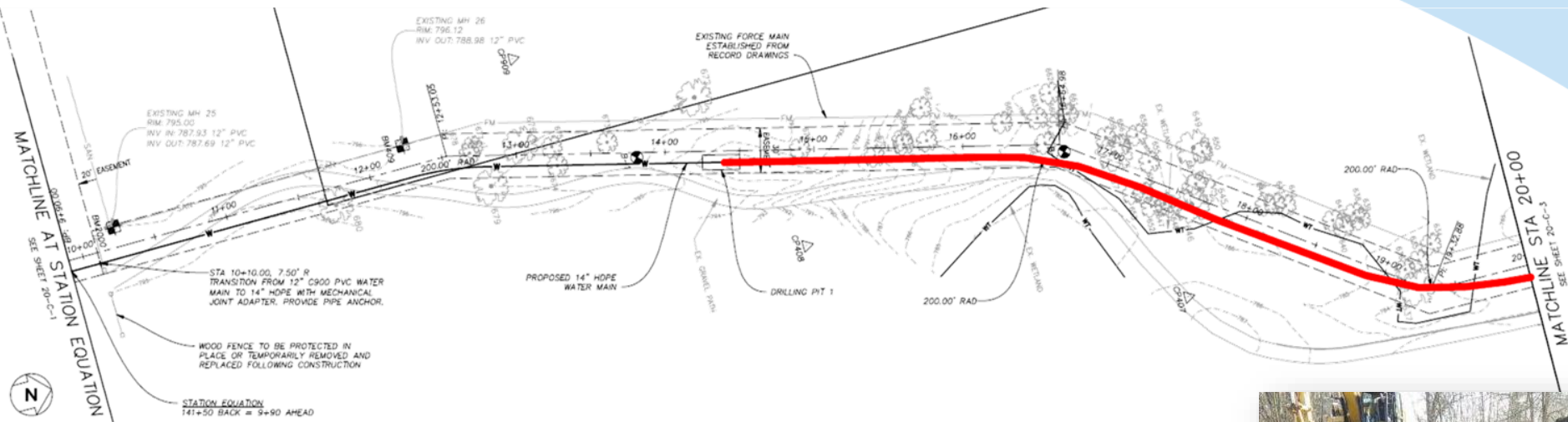
How do we minimize their impacts?

Plan

Be prepared

Respond

Drill #2



February 29 -
March 4,
2016

Temperature:
12° to 38°

0.3 inches
of rain

4 frac outs

Pulled
579-foot of
pipe with
tracer wire in
1.5 hours



Drill #2 Frac Outs

Plan

- Approved contingency plan
- Equipment and materials onsite for remediation

Be prepared

- Monitored the drill

Respond

- Immediate notification
- Containment and cleanup

Frac Out Notifications



Speed Dial

- LCSMC
- LCFP
- Village of Lake Villa



Sun Lake Drill Summary

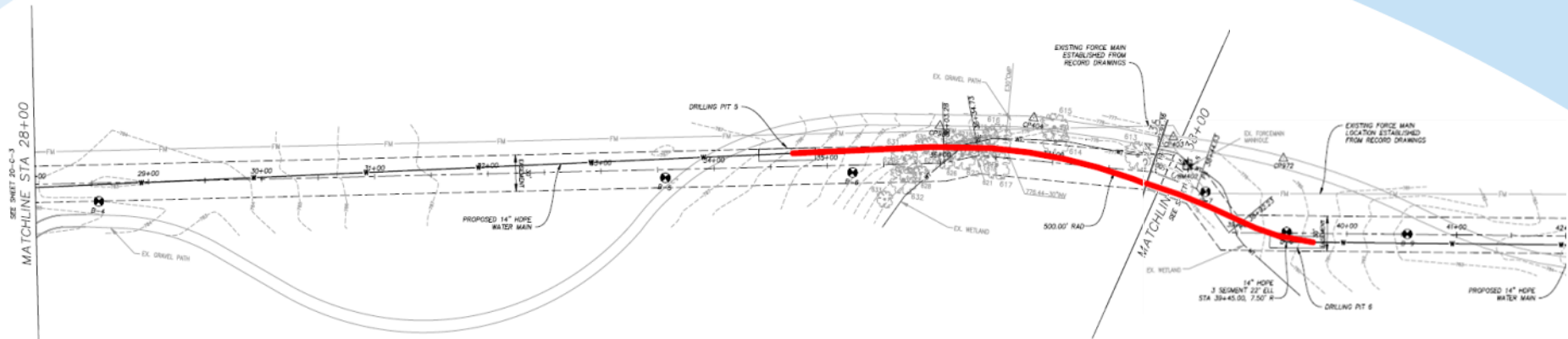
8 drills

20 total
frac outs

Lengths
of 425- to
698-feet

≈ 1
week
per drill

Creek Drill (#5)



March 22-31,
2016

Temperature:
34° to 56°

1.1 inches
of rain
+
trace snow

3 frac outs

Pulled
698-foot of
pipe with
tracer wire in
75 minutes



Creek Drill (#5) Frac Outs

Varied Soil Conditions

Be prepared



Stockpiled
sandbags

Respond



Cleanup

Respond

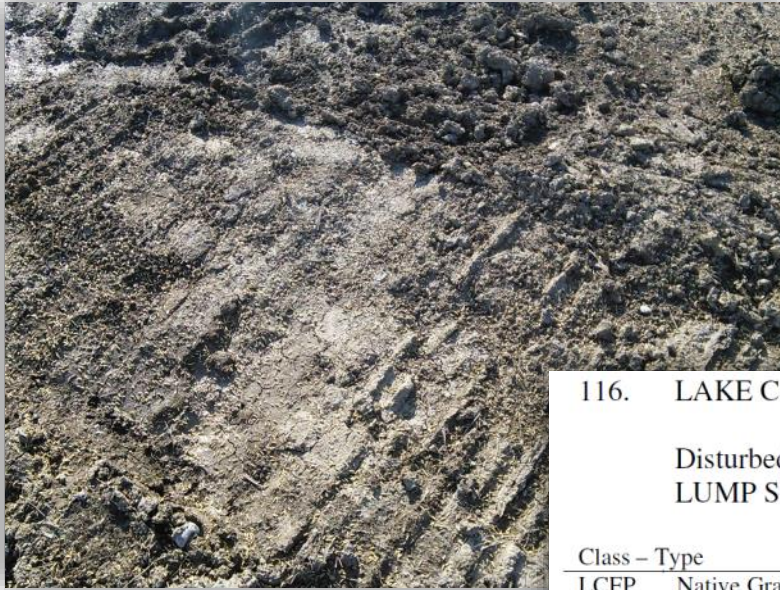


Containment

Creek Drill (#5) Frac Outs *Wetlands*



Restoration *Off Trail*

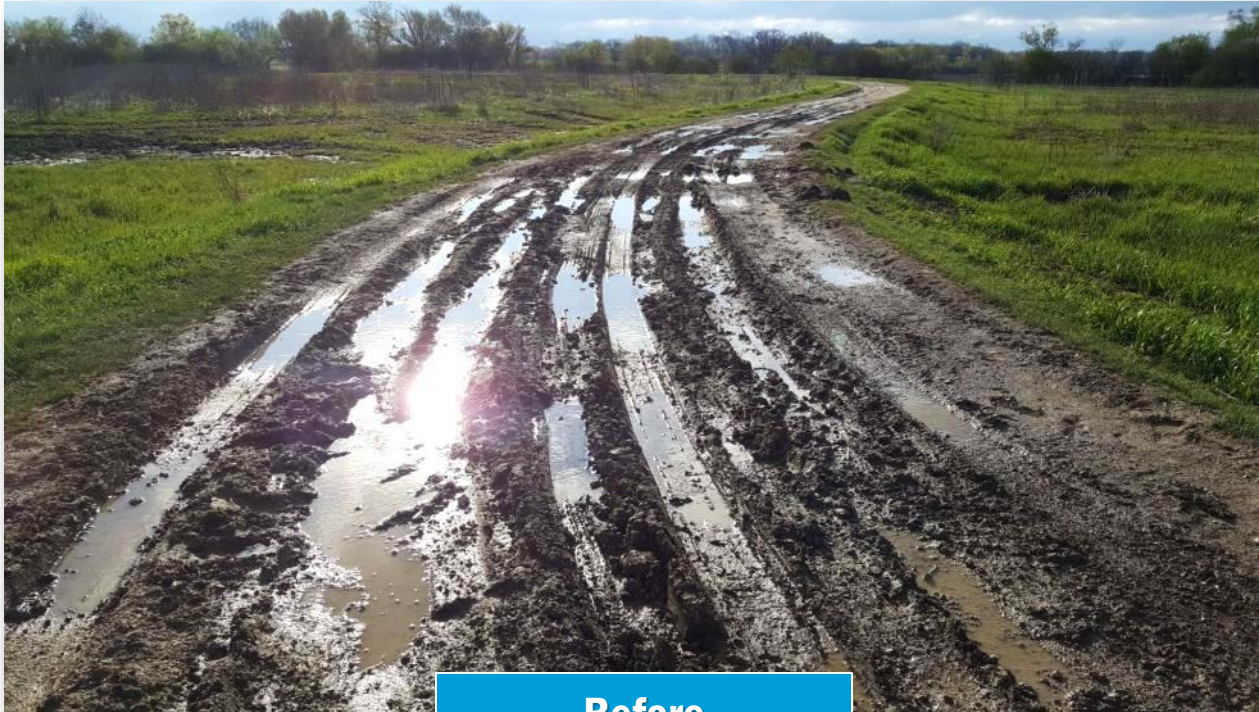


116. LAKE COUNTY FOREST PRESERVE SEEDING

Disturbed areas shall be restored with the following seed mix. This work shall be paid for with LUMP SUM for SEEDING, LAKE COUNTY FOREST PRESERVE.

Class – Type		Seeds	lb/acre (kg/hectare)
LCFP	Native Grass 8/, 8/	Andropogon Gerardi	4 (4)
		(Big Blue Stem) 5/	
		Andropogon Scoparius	5 (5)
		(Little Blue Stern) 5/	
		Bouteloua Curtipendula	5 (5)
		(Side-Oats Grama) 5/	
		Elymus Canadensis	1 (1)
		(Canada Wild Rye) 5/	
		Panicum Virgatum (Switch Grass) 5/	1 (1)
		Sonrghastrum Nutans (Indian Grass) 5/	2 (2)
	Annual Ryegrass	25 (25)	
	Oats Spring	25 (25)	
Class – Type		Seeds	lb/acre (kg/hectare)
LCFP	Forb		1 (1)

Restoration *Trail*



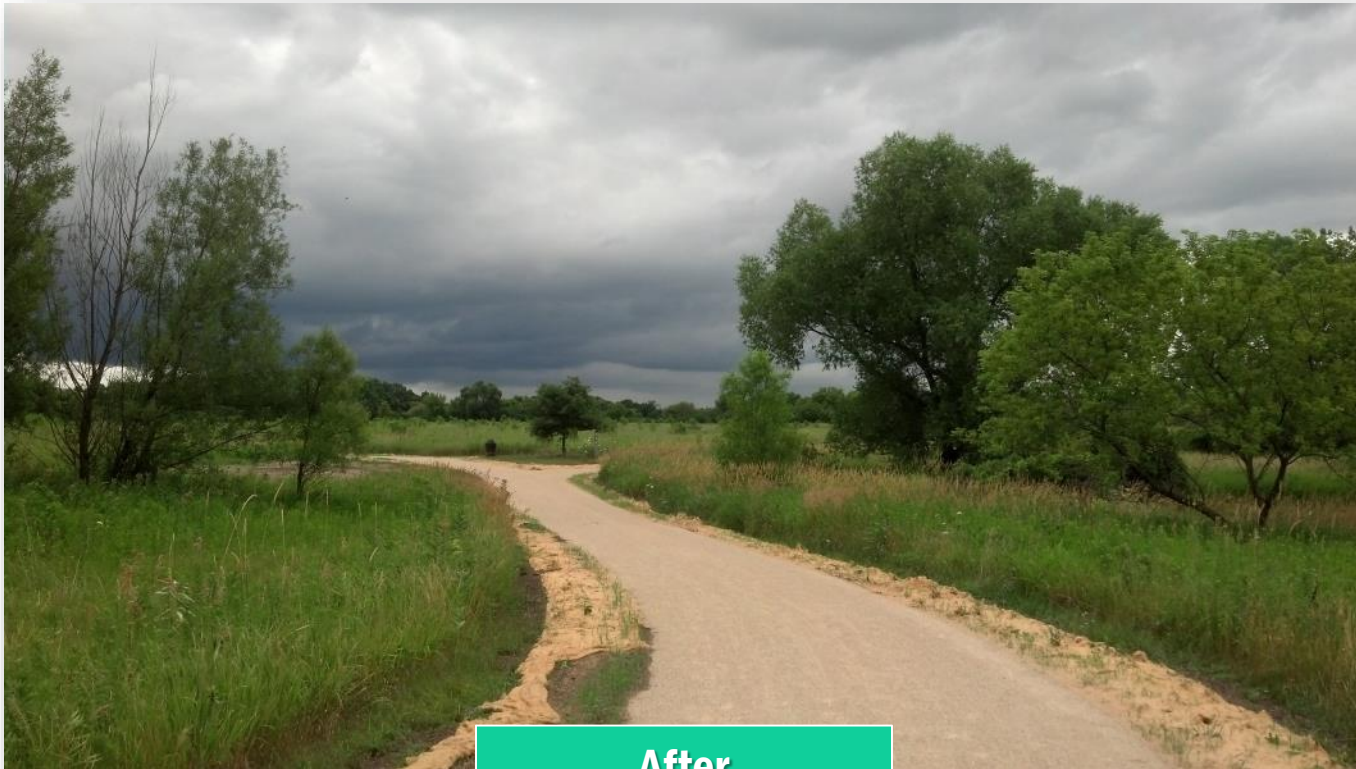
Before

Restoration *Trail*



During

Restoration *Trail*



After

Thanks!

Any questions?



A monarch caterpillar with yellow, black, and white stripes is crawling on a green milkweed leaf. In the background, there are dried, brownish seed heads of the plant. A semi-transparent white rectangular box is overlaid on the middle of the image, containing contact information.

Contact Information

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Engineers - Architects